

Estimation of Encounter-Level Hospitalization Costs: Accuracy of a Multivariate Prediction Model

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Wagner, Chen, and Barnett (2003 [this issue]) rightly identify the U.S. Department of Veterans Affairs' (VA's) historical lack of uniform cost data as an important barrier to economic analyses within the VA. Their article is an important contribution, and the cost estimates they generate should facilitate many types of health services research. At the same time, there are some aspects of their method that may limit the appropriateness of the cost estimates for certain types of analyses. We discuss several such aspects here.

The model estimates costs in the long run, meaning it assumes all costs are variable. In the VA, however, managers often must make decisions that are essentially short run in nature. For example, managers are often unable to close facilities or even buildings due to political constraints. If the model had adopted a short-run perspective (i.e., treating some costs as fixed rather than variable), some of the parameter estimates (for example, the marginal cost of an extra day of hospitalization) would be expected to decline substantially. The reason for this is that fixed costs are high relative to variable costs in the short run (Schwartz and Mendelson 1991, 1994; Taheri et al. 1998, 1999; Taheri, Butz, and Greenfield 2000a, 2000b; Williams 1996; Reinhardt 1996; Roberts et al. 1999).

For truly long-run analyses, in which it is appropriate and important to consider costs that managers consider fixed in the short run, cost estimates using the Wagner, Chen, and Barnett (2003) methodology are likely to play a

valuable role. Researchers using these data, however, may benefit by referring to several potential limitations of these cost estimates. For instance, the costing method used by Wagner, Chen, and Barnett allocates costs that are considered fixed in the short run to patients in proportion to costs that are considered variable in the short run. While practical and reasonably straightforward to implement, this allocation rule is essentially arbitrary, in the sense that it does not necessarily reflect the true cost of producing different types of medical-surgical hospitalizations. We recognize that there is no obvious way to address this issue using the available Medicare Provider Analysis Review data.

In addition, research suggests that the approach used to generate the cost estimates may be imprecise. Shwartz, Young, and Siegrist (1995) compared costs estimated using the ratio of cost to charge (RCC) method to costs based on relative value units (RVUs), which hospital managers regard as the best available costing methodology (Ashby 1993). The researchers found that RCC-estimated costs differed from RVU-estimated costs by more than 15 percent in more than one-third of patients. They concluded that RCC-estimated costs are “not a good basis for determining the costs of individual patients.” In addition, they found that costs estimated using hospital-level RCCs (the approach used by Wagner, Chen, and Barnett 2003) were more weakly correlated with RVU-estimated costs than costs estimated using departmental RCCs.

We note one more issue that may be important for interpreting research using these cost estimates. Wagner, Chen, and Barnett (2003) indicate that they “normalize” their cost estimates to the VA’s cost allocation system. While they do not describe the normalization process in detail, we understand it to mean that costs are multiplied by a constant factor so that, when aggregated, the dollar costs across hospitalizations sum to the relevant VA budget allocation. However, this VA budget allocation is not necessarily identical to the aggregate economic cost of producing these hospitalizations. As a result, their derived cost estimates can most appropriately be thought of as relative value weights for different hospitalizations, rather than as estimates of the absolute economic cost of production.

Estimating the cost of hospitalizations based on administrative data is difficult. The method developed by Wagner, Chen, and Barnett (2003) has a number of limitations, particularly for analyses in which a substantial proportion of costs is fixed. On the other hand, the method should be very helpful for decision makers and researchers seeking long-run cost estimates.

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